

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 970 742 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

12.01.2000 Bulletin 2000/02

(51) Int. Cl.⁷: B01F 13/08

(21) Application number: 99500114.6

(22) Date of filing: 06.07.1999

(84) Designated Contracting States:

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE

Designated Extension States:

AL LT LV MK RO SI

(30) Priority: 09.07.1998 ES 9801833

(71) Applicants:

• Ral Tecnica para el Laboratorio, S.A.
08770 San Juan Despi (ES)

• Life Science Technologies Ltd.
08770 San Juan Despi (ES)

(72) Inventors:

• Gallego Gutierrez, Adolfo
08970 San Juan Despi (ES)
• Schnabel, Steffen
08970 San Juan Despi (ES)

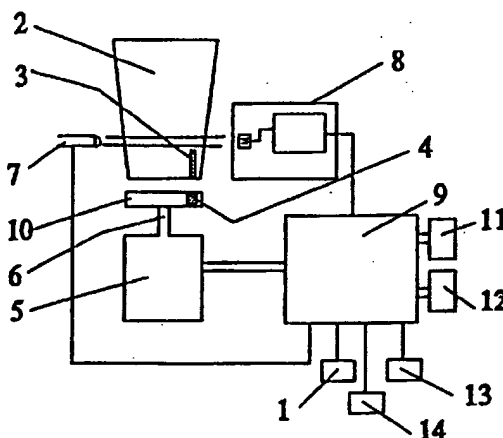
(74) Representative:

Marques Alos, Fernando
Tuset, 34
08006 Barcelona (ES)

(54) Improved agitator device

(57) "IMPROVED AGITATOR DEVICE", of the type used in analysis laboratories for the measurement of times of formation of coagulation in studies of blood haemostasia, which incorporates within it a magnetised agitator bar (3) in a basically cylindrical form, characterised essentially because the cylindrical magnetised bar (3) is actioned by a magnet (4) which is located at one side of the interior of a support (10) on which the receptacle (2) is placed, the said magnet (4) presenting a vertical orientation of the magnetic poles, which means that, through the magnetic field, the magnetised bar (3) is positioned vertically, comprising a motor (5) on the shaft of which (6) the support (10) is fixed, which incorporates laterally within it the magnet (4), presenting a motion which causes a circular movement of the bar (3) of the receptacle (2).

Fig.1



EP 0 970 742 A2

Description

DESCRIPTION OF THE INVENTION

[0001] The object of the present invention, as has been expressed in the summary of this descriptive memorandum, consists of a **"IMPROVED AGITATOR DEVICE"** of the type used in analysis laboratories for the measurement of times of formation of coagulation in studies of blood haemostasia.

[0002] Currently, in order to ascertain the speed of coagulation of blood, an optical method is used, among others, consisting in the measurement of the intensity of light supplied by the liquid at a determined time.

[0003] To carry out this method, the receptacles containing the liquid blood to be analysed are inserted into a spectrophotometric apparatus which measures the frequency of the radiation passing through the liquid, recording all the turbodensometric variations which are produced in the receptacle.

[0004] The spectrophotometric apparatus has available a constant source of light which passes through the sample to be analysed and falls on a detector placed opposite to it on the other side of the receptacle.

[0005] This detector presents various levels of detection, automatically preselected in the spectrophotometric apparatus before beginning the programmed measurement.

[0006] In order that the measurement is carried out as accurately as possible, a magnetised agitator body has traditionally been employed, introduced into the interior of the receptacle and moved in a circular manner due to the magnetic force exerted by a magnet located in the body supporting the receptacle, which in its turn is turned in a circle on its own axis by means of a motor.

[0007] The said body generally presents an aerodynamic cylindrical form similar to a suppository, and its movement is horizontal over its centre of gravity, with the north and south poles at the ends turning, following the poles of the magnetised body in the interior of the support of the receptacle.

[0008] This type of agitation by means of the cylindrical body, leaves areas in the upper part of the receptacle without being completely agitated, so that the spectrophotometric measurement is not at all accurate.

[0009] For this reason, a novel system of agitation has been developed by means of a magnetised body of round configuration. This magnetised ball moves in the interior of the receptacle, making circles, due to the magnetic power of a part, incorporating the magnet, located under the support of the receptacle, which is turned in a circle by means of a rotor shaft linked to a motor.

[0010] This procedure improves considerably the homogenisation of the liquid in the receptacle, in incorporating a magnetic ball which makes circles around the base of the receptacle, but still dead areas exist in the liquid where the turbulence created by the ball does not

attain sufficient force to make a correct mixture.

[0011] For all these reasons, the novel improved agitator device has been developed which completely solves the problem of the homogenisation of liquids.

[0012] Basically, the improved agitator device consists of a thermostatic group with various positions, to maintain the receptacles and one or several measurement cells, guaranteeing a constant working temperature.

[0013] It also has available measurement receptacles in which the reagents and the samples to be analysed are placed, in the interior of which is incorporated a magnetised agitator rod of a basically cylindrical form to homogenise the samples and reagents during the test. This rod is activated by a magnet, located in the interior of the receptacle support, which presents a vertical orientation of the magnetic poles, due to which the agitator rod adopts a vertical position within the receptacle.

[0014] At the same time, the magnet in the support acquires a circular movement through the action of the motor, the shaft of which holds the support which has the magnet in it on one side, moving in its turn the vertically positioned rod and thus producing the needed homogenisation.

[0015] It also has an optical system comprising an excitation source and a light/frequency converter detector which records all the turbodensometric variations occurring in the receptacle. The converter detector acts as a source of constant light passing through the sample to be analysed and falling on the converter detector which has several levels of detection automatically preselected by the system before beginning the programmed measurement, thus guaranteeing greater accuracy and assurance in the detection of coagulation.

[0016] Finally, the novel improved agitator device has an electronic system, controlled from a the central unit, which governs the whole process, from the voltage of the detector, the agitator motor, a digital chronometer, a screen, the keyboard, the block temperature and the whole system in general.

[0017] Due to the novel configuration of the improved agitator device, a vertical positioning of the agitator rod is achieved within the interior of the receptacle, which provides a perfect homogenisation in the interior of it for the determination of the times of formation of coagulation or other processes.

DESCRIPTION OF THE DRAWINGS

[0018] For the purpose of illustrating what is explained above, accompanying the present descriptive memorandum, and forming an integral part of it, is a sheet of drawings in which is represented, in a simple and schematic manner, merely illustrative and not limiting in any way, an example of one application of the practical possibilities of the invention.

In these drawings, fig. 1 corresponds to a schematic view of the novel improved agitator device.

Fig. 2 corresponds to a sketch of the behaviour of the magnetised rod when as it approaches the support magnet.

DESCRIPTION OF A PRACTICAL CASE

[0019] The novel "IMPROVED AGITATOR DEVICE" is constituted by a thermostatic group (1) with various positions to maintain the measurement receptacles (2) at a constant temperature, in which the reagents and the samples to be analysed are placed, and which incorporate within the interior a magnetised agitator rod (3) of a basically cylindrical form.

[0020] The rod (3) is activated by a magnet (4) from a spectrophotometer, which is located in one side of the interior of the support (10) where the receptacle (2) is placed.

[0021] This magnet (4) presents a vertical orientation of the magnetic poles.

[0022] At the same time, the magnet (4) of the support acquires a circular movement through the action of the support (10), driven by a motor (5) on the shaft (6) of which it is fixed, due to which the vertically positioned rod is moved.

[0023] The novel device has also an optical system comprising an excitation source (7), and a light/frequency detector converter (8) which records all the turbodensometric variations occurring in the receptacle. The light from the constant excitation source (7) passes through the sample to be analysed and falls on the detector converter (8) which has various levels of detection automatically preselected by the system before beginning the programmed measurement.

[0024] Finally, the novel improved agitator device has an electronic system, controlled from the central unit (9), which governs the whole process, from the voltage of the detector (8), the agitator motor (5), a digital chronometer, a screen (13), the keyboard (14), the block temperature (1), an RS 232 output (11), printer (12) and the whole system in general. Having made the description to which the above memorandum refers, it is necessary to insist that the details of carrying out this idea can be subject to small alterations, always based on the fundamental principles of the idea, which are essentially those reflected in the paragraphs of it.

[0025] In fact, the current Patent Law establishes as not patentable any changes of shape, dimensions, proportions and materials of an object already patented, the criteria of the legislator thus being fixed in the sense that an idea which can give rise to a practical reality which can be used industrially, once patented, no-one can take advantage of it for the purpose of introducing small modifications which they introduce as new and their own.

[0026] Having established the concept expressed, there follows the note of claims, thus bringing together the novelties which it is desired to claim:

NOTE

[0027] In summary, the privilege of exclusive exploitation requested concerns the following claims:

Claims

1. "IMPROVED AGITATOR DEVICE", of the type used in analysis laboratories for the measurement of times of formation of coagulation in studies of blood haemostasia, constituted by a thermostatic group (1) with various positions to maintain the measurement receptacles (2) at a constant temperature, in which the reagents and the samples to be analysed are placed, and which incorporate within the interior a magnetised agitator rod (3) of a basically cylindrical form, also with an optical system comprising an excitation source (7), a light/frequency detector converter (8), controlled from a central unit (9), which governs the whole process, from the voltage of the detector, the agitator motor, a digital chronometer, a screen (13), an RS 232 output (11), a printer (12), the keyboard (14), the block temperature, and the whole system in general, characterised essentially because the cylindrical magnetised rod (3) is actioned by a magnet (4), which is located at one side of the interior of a support (10) on which the receptacle (2) is placed, the said magnet (4) presenting a vertical orientation of the magnetic poles, which means that, through the magnetic field, the magnetised rod (3) is positioned vertically.
2. "IMPROVED AGITATOR DEVICE", according to the above claim, characterised by having a motor (5) on the shaft of which is fixed the support (10) which incorporates in its interior and on one side the magnet (4), which presents a movement which imparts to the rod (3) of the receptacle (2) a circular movement.

All this as set out in the present descriptive memorandum, drawn up upon six sheets properly numbered, typed on one side at line spacing one-and-a-half, and another of drawings.

Fig.1

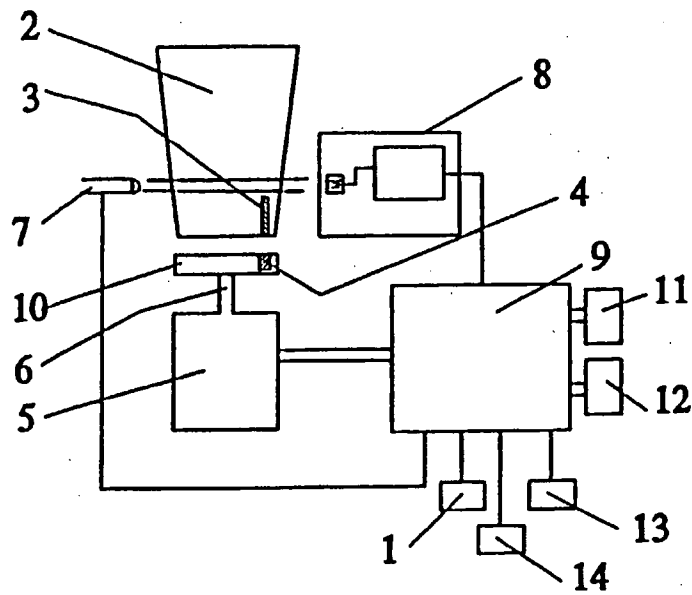


Fig.2

